What is claimed is:

1. A hydraulic forming process wherein fluid is sealedly filled at one side of a workpiece interposed between a movable die and a fixed die and the pressure of the fluid is increased by pressing down the movable die toward an accommodating section of the fluid, whereby a part of the workpiece is deformed toward a forming space section formed at the other side of the workpiece to thereby perform a forming on the workpiece.

2. A hydraulic forming process claimed in Claim 1, wherein the compression ratio of the fluid is not more than 3.0×10^{-5} cm^2/kg.

3. A hydraulic forming process claimed in Claim 1, wherein the viscosity of the fluid can be 100 to 1500 cSt.

4. A hydraulic forming process claimed in Claim 1, wherein the fluid is a mixture of glycol and water at a predetermined ratio.

5. A hydraulic forming process claimed in Claim 1, wherein the workpiece can be formed such that one side thereof is surface-treated and the same side comes in contact with the fluid.

6. A hydraulic forming process for forming a convex section at a central section of a plate-like workpiece that is interposed between an upper die and a lower die with its peripheral edge section clapmed, comprising:
a first step for placing the workpiece on the top end section of the lower die

with a hollow section formed on the lower die filled with fluid so as to prevent air from entering;

a second step for lowering a blank holder arranged at the outer periphery of the upper die so as to clamp the peripheral edge section of the workpiece placed on the lower die by the blank holder and the top end section of the lower die; and

a third step for lowering the upper die relative to the lower die for pressedly deforming the central section of the workpiece as well as for compressing the fluid to increase its pressure, thereby transferring a shape of a formed section formed on the upper die on the workpiece by the fluid having the increased pressure for forming a convex section.

7. A hydraulic forming process claimed in Claim 6, further comprising a fourth step for maintaining the upper die to thereby keep the fluid pressure of the fluid for a predetermined time after the shape of the formed section on the upper die is transferred onto the workpiece at the third step.

8. A hydraulic forming process claimed in Claim 7, further comprising a fifth step for releasing the fluid pressure of the fluid after the upper die is maintained to keep the fluid pressure of the fluid for the predetermined time at the fourth step.

9. A hydraulic forming device comprising:

a support section that can support a workpiece placed thereon;

a lower die having a hollow section enclosed by the support section and filled with fluid;

a blank holder that can be moved upwardly and downwardly and can clamp a peripheral edge section of the workpiece with the support section of the lower die; and

an upper die that can be moved upwardly and downwardly, has a formed section at its bottom surface and can get into the hollow section of the lower die with the central section of the workpiece having the peripheral edge section clamped by the support section of the lower die and the blank holder.

10. A hydraulic forming device claimed in Claim 9, comprising a supplying/exhausting/sealing device that supplies fluid to the hollow section of the lower die to fill the same before the workpiece is placed on the support section of the lower die, seals the fluid filled in the hollow section when the workpiece is formed by the upper die and the lower die and discharges the fluid from the hollow section before the upper die is withdrawn from the hollow section of the lower die after the forming.

11. A hydraulic forming device claimed in Claim 10, wherein the supplying/exhausting/sealing device is provided with a composite valve composed of a check valve that allows the flow of the fluid from a hydraulic supply source to the hollow section of the lower die and a relief valve that can change a pressure retainable in a path between the hollow section of the lower die and the check valve according to a change-over operation and has a relief pressure set low in a normal state while a relief pressure set high when the workpiece is formed, wherein a valve body of this composite valve may be directly installed to the lower die.

12. A hydraulic forming device claimed in Claim 11, wherein the valve body is provided with a mounting port to which a pressure sensor can be mounted.

13. A hydraulic forming device claimed in Claim 12, wherein the workpiece has one surface having a surface treatment performed thereon and is placed on the support section of the lower die with the same surface brought into contact with the fluid.

14. A hydraulic forming device claimed in Claim 9, wherein the workpiece has one surface having a surface treatment performed thereon and is placed on the support section of the lower die with the same surface brought into contact with the fluid.

15. A metal separator for a fuel cell composed by forming a great number of convex sections, wherein the convex sections are formed by a hydraulic forming process comprising:

a first step for placing a metal separator material on the top end section of the lower die with a hollow section formed on the lower die filled with fluid so as to prevent air from entering;

a second step for lowering a blank holder arranged at the outer periphery of the upper die so as to clamp the peripheral edge section of the metal separator material placed on the lower die by the blank holder and the top end section of the lower die; and

a third step for lowering the upper die relative to the lower die for pressedly

deforming the central section of the metal separator material as well as for compressing the fluid to increase its pressure, thereby transferring a shape of a formed section formed on the upper die on the metal separator material by the fluid having the increased pressure for forming a convex section.

16. A metal separator claimed in Claim 15, wherein the hydraulic forming process for forming the convex sections includes a fourth step for maintaining the upper die to thereby keep the fluid pressure of the fluid for a predetermined time after the shape of the formed section on the upper die is transferred onto the metal separator material at the third step.

17. A metal separator claimed in Claim 16, wherein the hydraulic forming process for forming the convex sections includes a fifth step for releasing the fluid pressure of the fluid after the upper die is maintained to thereby keep the fluid pressure of the fluid for the predetermined time at the fourth step.

18. A metal separator claimed in Claim 15, wherein the compression ratio of the fluid used for the hydraulic forming process is not more than 3.0 $\times 10^{-5}$ cm^2/kg.

19. A metal separator claimed in Claim 15, wherein the viscosity of the fluid used for the hydraulic forming process is 100 to 1500 cSt.

20. A metal separator claimed in Claim 15, wherein the fluid used for the hydraulic forming process is a mixture of glycol and water at a

predetermined ratio.

21. A metal separator claimed in Claim 15 wherein the metal separator material is formed such that one side thereof is surface-treated and the same side comes in contact with the fluid.